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Animal Language

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Here is a quote from Norman Malcolm who was the president of the American Philosophical Association. This is his presidential speech from 1973 and he said, “The relationship between language and thought must be so close that it is… senseless to conjecture that animals *may* have thoughts [3].” So if you don’t have language, you don’t think. This is still how a lot of people believe that animals operate. The view of linguists is that only humans have language. That there is somehow a biological mutation, whether it is a mutation that allows our tongues to swivel in a certain way or something to do with our gestures, but there is a biological mutation that allows humans to have language but not any other animal [4]. The perception still is that there is a large gap between us and the rest of the animals [5]. In my book *Chasing Doctor Doolittle,* I show that animals do have language. Even though I wrote this book for a popular audience and not for a scientific audience, I have used 2,250 scientific references from the scientific literature that shows we already have lots of evidence that a number of animals either have language or have pieces of what we might consider language which with further study would transition them into actually having language.

I need to define what is language and what is communication [6]. People are quite happy to say that animals communicate. That is not a problem. But when you get into animals having language that is a problem for some people. I was speaking to a colleague

a while ago and he said: “Why do you insist that animals have language? Why don’t you just simply say that animals communicate? Then everybody would be happy. You won’t have the trouble that you have now.”

In my terms, I define communication as a system of hardwired stimulus responses probably generated by instinct [7]. A cell phone is a communication device. It receives a signal and it is hard wired and designed to respond to that signal in a certain way. A computer works the same way. Language, on the other hand, I define differently. Now linguists have different criteria for language. Linguist Carol Hawkins developed thirteen criteria in the late 1950s and early 1960s to show that animals have language. When some of us have shown all 13 criteria they have suddenly moved the goal posts [8].

I have simplified things and I think that for both humans and animals there are four important features that we have to show. One is flexibility. In other words, in a given context the animal tends to be flexible about what kind of signals the animal uses. Another is intentionality: the animal intends to send information to others. Third, novelty: that the animal can come up with novel signals so that the animal is not always blocked into just the small set of signals. The fourth is structure, which we humans would call grammar. Some kind of way of combining signals; you might also call it syntax.

I would like to illustrate for you… this is the evolutionary continuum that biologists and linguists, even if they believe in evolution, even if they believe in the continuity of life, still many of them feel there is a gap between all the rest of the animals and humans, where humans only have consciousness, self awareness, intentionality, novelty, and language [9]. A more reasonable view is emerging from the cognitive revolution which started roughly twenty years ago where we essentially have a transition

from instinct to communication, consciousness, social awareness, and language. In my book I propose something that I call the discourse system for talking about language in animals [10]. The reason I propose this is that I realized we had a hidden system that nobody seemed to be aware of that pertained to language and communication that used other systems [11]. The features of this system are: it is shared in common with most multicellular organisms, it is designed to receive, evaluate, and respond to signals, it is evolved in conjunction with other physiological systems, uses components of those other systems, and most importantly it responds to selective pressures. It responds to evolution and it is a feature of evolutionary pressure. It results in the development of specialized structures for receiving and producing signals. Let me show you how I think it works [12].

Incoming signals are picked up in the sensory system and move to the brain where the brain receives and decodes these signals mitigated by internal cues from other systems like the endocrine, reproductive, and the digestive system. Then muscular and skeletal movements go to specialized structures, which produce things. This provides us with a continuum. Using this system we can have completely hardwired or stereotypical behavior, which I would call communication. We can have evaluation and responses involving choice and some kind of a behavioral toolbox that the animal has. We can have partially novel behavior, a toolbox of behavior plus some new application, and then we can have completely novel signals. Just to give you a sense of how this might work, in Arizona right now Red-Winged Blackbird males are setting up their territories. A Red-Winged Blackbird male might, say, expose his red epaulettes, which become bright red, lift up his wings, and go '*wree.*' *H*ow another Blackbird male responds to that depends

not only on what the brain is receiving but what is happening in the other systems. What is happening in the endocrine system? Are the hormones flowing quickly enough for the male to respond? What is happening with the reproductive system? What is even happening with the digestive system? Did the male eat a lot of bugs and doesn't feel like responding anymore?

When we look at the whole spectrum of communication and language from the perspective of this discourse system, we can see that it is essentially found throughout multicellular organisms. It allows communication and language to evolve along with other organ systems. The bottom line is there is no gap between us and other species [13]. We all share components of the discourse system [14]. The challenge is, how do we get this into the minds of people to change our policies toward animals?

I spent a number of years decoding the language of prairie dogs. One of the things that I have found is that people normally start off thinking of prairie dogs as vermin or something that they don't pay attention to [15]. They are small rodents and they are just out of people's consciousness. When I tell people that prairie dogs have a language their eyes suddenly light up and they start to empathize with these animals. They start to see that these animals are real sentient beings that have similarities themselves. I think that getting this viewpoint across about language in animals is a way to get people to empathize with them. The problem is that scientific studies of language are very lengthy. I am going to show you a nine-minute video that summarizes the work I have done with prairie dogs. I think this project is an important example of the kind of stuff we can find out if we only look. The unfortunate thing is scientists are human. We scientists need to believe something in order to look for it. If we don't believe that it is then we don't

bother to look. Once we believe that something is there and we start looking we can find some amazing things. Keep in mind, prairie dogs are rodents. Theoretically, they should be relatively low on the evolutionary scale compared to primates or even dogs. They are small creatures, about a foot high when they stand up, and weigh between 1-2 pounds. [video plays]

It is difficult to come up with a lot of scientific evidence. That was nine minutes covering thirty years worth of work. On the other hand, we have a lot of anecdotal evidence. I see posts on Facebook all of the time of sharks, orcas, dogs, and other animals doing interesting things. I have a suggestion in terms of policy [17]. Why not collect it and put it to work? Right now there are people who are analyzing Twitter and Facebook posts. From that scientific analysis we can extract what people are feeling and thinking. I think we can do the same thing with anecdotal evidence relating to animals [18]. Here is a form that I came up with that could be put up on the Internet and distributed widely to people who are interested in animals. Essentially, people fill in a description of what they are seeing as well as descriptions of the animal and so on. There are enough people who are interested in animals to do that. If we can collect enough of a database we can apply the same techniques Twitter uses to figure out what a particular movie star is doing and apply this to find out what animals might be doing [19]. We all understand that people have very imperfect ideas of what animals are doing and that is why we would need a large database to be able to use this. I think this is a viable way of collecting enough information so that we can use that information to make policy decisions about how people perceive animals and what people think that animals are doing. I have four conclusions: one is that animals have language so this is not a barrier to animals [20],

another is that the discourse system shows the continuity of language in animals [21], and the third is let’s capture novel animal behaviors and evidence for animal language and thinking by using these old anecdotes [22], and my last conclusion is that we are not that different after all [23].